



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,915	12/30/2005	Keiji Aota	DK-US055285	3812
22919 7590 09/25/2007 GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680			EXAMINER DESAI, NAISHADH N	
			ART UNIT 2834	PAPER NUMBER
			MAIL DATE 09/25/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/562,915

Applicant(s)

AOTA ET AL.

Examiner

Naishadh N. Desai

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/30/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/30/2005, 7/13/2006, 2/9/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 12/30/2005, 7/13/2006 and 2/9/2007 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Asano et al (US 6218753).

4. As per independent claims 1:

A rotor comprising: a rotor core having a rotor surface;

a plurality of permanent magnets embedded in the rotor core with each of the permanent magnets having a pair of poles [Fig 7 of Asano et al],

a plurality of first non-magnetic layers with one of the first non-magnetic layers being located between each adjacent pairs of the permanent magnets along the rotor surface and being continuous or adjacent to a peripheral edge section of each of the permanent magnets in a vicinity between the poles and a vicinity of the rotor surface; and [Fig 6 element 63]

a plurality of second non-magnetic layers with one of the second non-magnetic layers being located a vicinity of the rotor surface at a pole center side position with respect to the peripheral edge section of each of the permanent magnets or the first non-magnetic layers [Fig 6 element 67],

the first non-magnetic layers and the second non-magnetic layers being positioned to cancel n -th order harmonics (where n is an odd number and is equal to or greater than 3) of an induction voltage [it is inherent to those skilled in the art that the non-magnetic layers would be positioned to cancel n -th order harmonics or torque ripples[Col 2 lines 5-14 of Asano et al] and also Hasumi [US 6972503 in Col 9 lines 33-40] discloses the effects of torque ripple and harmonics to reduce vibrations and noise in a motor].

5. As per dependent claim 10:

Figure 6 of Asano et al shows the magnets to be divided into multiple layers in the radial direction.

6. As per dependent claims 11 and 12:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core with different angles for the non magnetic sections, wherein the permanent magnets are divided into two layers in the radial direction. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

7. As per dependent claims 13-14:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core width having points of inflection and different angles for the non magnetic sections, where in the permanent magnets are divided into two layers in a radial direction. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of

Art Unit: 2834

numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-9 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al in view of Hasumi (US 6972503).

9. As per dependent claims 2 and 3:

Asano et al teaches the device in claim 1 above. Asano et al do not explicitly disclose the use of 3-rd order harmonics or other multiples of 3. Hasumi in Col 9 lines 37-40 speaks of 3-rd order harmonics. Also Hasumi et al discloses the claimed invention except for explicitly disclosing that the n-th order harmonics can be multiples of 3. It would have been obvious to one having ordinary skills in the art at the time the invention

was made to make the n-th order harmonics other multiples of 3, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

10. As per dependent claim 4:

Hasumi in Col 9 lines 37-40 speaks of 5-th order harmonics.

11. As per dependent claim 5:

Figures 6 and 7 of Asano et al shows the first and second non-magnetic layers to be independent.

12. As per dependent claims 6 and 7:

Figure 7 and Col 3 lines 34-41 of Asano et al disclose different angles for the non magnetic sections.

It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify and manipulate the angles of Asano et al with the 3-rd and 5-th harmonic revelations of in view of Hasumi to derive the formula and angles as claimed. The motivation to do so would be that it would eliminate unbalance, reduce leakage flux, noise and vibrations of the motor (Col 3 lines 59-63 of Asano et al).

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus,

a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

13. As per dependent claims 8 and 9:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core width having points of inflection and different angles for the non magnetic sections. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify and manipulate the angles of Asano et al with the 3-rd and 5-th harmonic revelations of in view of Hasumi to derive the formula and angles as claimed. The motivation to do so would be that it would eliminate unbalance, reduce leakage flux, noise and vibrations of the motor (Col 3 lines 59-63 of Asano et al).

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

14. As per dependent claims 15 and 16:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core having independent first and second non-magnetic layers. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify and manipulate the angles of Asano et al with the 3-rd and 5-th harmonic revelations of in view of Hasumi to derive the formula and angles as claimed. The motivation to do so would be that it would eliminate unbalance, reduce leakage flux, noise and vibrations of the motor (Col 3 lines 59-63 of Asano et al).

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

15. As per dependent claims 17 and 18:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core width having points of inflection and different angles for the non magnetic sections. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify and manipulate the angles of Asano et al with the 3-rd and 5-th harmonic revelations of in view of Hasumi to derive the formula and angles as claimed. The motivation to do so would be that it would eliminate unbalance, reduce leakage flux, noise and vibrations of the motor (Col 3 lines 59-63 of Asano et al).

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

16. As per dependent claim 19:

Figures 14 and 15A-B of Asano et al shows the magnets to be divided into multiple layers in the radial direction.

17. As per dependent claim 20:

Figure 7, 15A-B and Col 3 lines 34-41 of Asano et al disclose a rotor core having different angles for the non magnetic sections, where in the permanent magnets are divided into two layers in a radial direction. The motor of Asano et al has 4 poles, which computes to make the angles fall well within the ranges of the formulas as claimed.

It would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify and manipulate the angles of Asano et al with the 3-rd and 5-th harmonic revelations of in view of Hasumi to derive the formula and angles as claimed. The motivation to do so would be that it would eliminate unbalance, reduce leakage flux, noise and vibrations of the motor (Col 3 lines 59-63 of Asano et al).

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Schrader*, 22F.3d at 294-95, 30USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. MPEP 2106.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Morrill teaches an asynchronous induction motor. Nishijima teaches a brushless DC motor and brushless DC motor controller. Nakamura et al teaches a motor with reduced clogging torque incorporating stator salient poles and rotor magnetic poles. Nakano et al teaches a permanent magnet motor.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naishadh N. Desai whose telephone number is (571) 270-3038. The examiner can normally be reached on M-F.

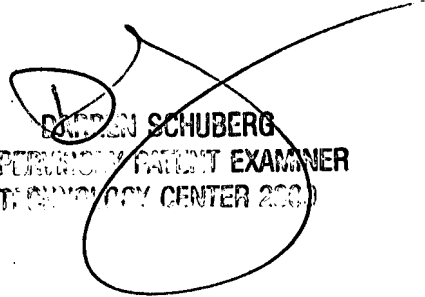
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2204. The fax phone

Art Unit: 2834

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Naishadh N Desai
Patent Examiner


DORIAN SCHUBERG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2000